2012

Seeds of hope : improving the nutritional environment of Seaside Middle School

Emily Abrahams
California State University, Monterey Bay

Seeds of Hope: Improving the Nutritional Environment of Seaside Middle School

Emily Abrahams
May 18, 2012
Department of Health and Human Services and Public Policy
California State University Monterey Bay

Table of Contents

Contents

Table of Contents

Abstract:

Schools play a crucial role in the development of children. One way schools can be utilized is by positively influencing the eating habits of students. Poor diet has caused many detrimental effects within our society. In order to address the issue of poor nutritional environments in schools, Harvest of the Month (HOTM), a nutritional program provided through Community Alliance with Family Farmers (CAFF), was implemented in a 6th grade class as a pilot program. The program then expanded to 3 more 6th grade classes. Along with implementing the HOTM program, steps to begin a fruit tree orchard were also taken. Statistical data was gathered on the student population as well to analyze the relationship between eating habits, nutritional knowledge and academic achievement. The goal of the project is to improve the school nutritional environment through a holistic approach of knowledge, access and interaction with fresh fruits and vegetables.

Key Words: Child, Nutrition, School-based, Curriculum, Harvest

Seeds of Hope: Improving the Nutritional Environment of Seaside Middle School

Problem Definition

Nutrition of school age children within the U.S. has proven to be dismal. Consumption of fruits, vegetables, whole grains, and lean proteins is minimal, while consumption of empty calories makes up a disproportionate amount of the caloric consumption. Also, less than 32 percent of school age children report eating at least two servings of fruit a day, and less than 13 percent of school age children report eating at least three servings of vegetables a day (CDC, 2010). It is a startling fact to know that nearly 40% of U.S. children's intake of calories is from solid fat and added sugar (Reedy & Krebs-Smith, 2010). The majority of food consumption by U.S. youth, ages 2-18 is primarily from 6 major foods with minimal nutritional value including soda, fruit drinks, dairy desserts, grain desserts, pizza and whole milk (Reedy & Krebs-Smith 2010). These rates far exceed the limit of empty calories, which is generally accepted to be between 8-20%, depending on the age/sex (Reedy & Krebs-Smith, 2010). This lack of consumption of fresh produce and over consumption of empty calories is a societal issue, which has created an array of symptoms increasing to epidemic proportions in our society.

It is argued that it is the sole responsibility of the parent(s) to implement ideals of good nutritional behavior in children (Moss-Coane, 2010). By setting up this argument, many fail to realize that it is not only, or always, the parents who are responsible for nutritional habits of our youth. Children spend approximately 5-7 hours per day, five days a week in an academic educational environment. For about 95% of U.S. children, this academic environment is a public school setting (Weschler, 2004). This is a large portion of children's lives in which they are developing behaviors outside of the influence of parents. Schools play a distinctive role in the development of our youth, teaching them life habits and skills along with basic education

(Brown, et. al, 2008). Because of this unique position, it is essential that schools also foster environments that support ideals of proper nutrition. These environments should convey consistent messages of healthy food choices through education, attitudes surrounding nutrition, and access to these foods. The nutritional environment of most public schools commonly does not support the recommended nutritional guidelines set by the U.S. Department of Agriculture (USDA) for children of this age group.

Over 31 million children are provided meals each school day across the United States through the National School Lunch Program (NSLP). The National School Lunch Program was established in 1946 by President Harry Truman and was designed to provide adequately nutritional meals to children throughout the school day. Under the NSLP, children who met criteria for being at a socioeconomic disadvantage are able to receive the meals free or at a reduced cost under the Free and Reduced Lunch Program (FRLP) ("National school lunch", 2011). Though meals may be provided to children, commonly these meals contribute to the issue of poor nutrition among youth. Over 70 percent of the meals provided through the National School Lunch Program exceed the limits for saturated fat, and over 80 percent of the meals provided exceed the limits for fat over-all (Gordon & Fox, 2007). Also, only about 50 percent of public schools participating in the NSLP provide fresh fruits and vegetables on a daily basis, with significantly lowered amounts of fresh produce provided in schools with higher percentages of children participating in the FRLP (Finkelstein, Hill & Whitaker, 2008).

Consequences

The top three leading causes of death within the United States are heart disease, cancer, and stroke, all of which strongly correlate to poor nutrition over a lifetime (Centers of Disease, MMRW, 2011). A visible symptom of poor nutrition is being overweight or obese. Childhood

obesity rates have more than tripled over the past four decades, with an estimate of 17% of 2-19 years olds to be currently obese (Ogden & Carroll, 2010). Being obese or overweight as a child or adolescent is a strong indicator of later being obese or overweight as an adult, thus developing chronic conditions which may cause premature death (CDC, 2011).

Figures 1 and 2 below represent the rise in obesity rates among adolescents ages 12-19 between the years 1988-1994 and 2007-2008. Across all ethnicities and both sexes there was a dramatic increase in rates of obesity. However, it is noted that non-white minority populations experienced a more dramatic rise in the increase of obesity than did white populations of similar age and gender (Ogden & Carroll, 2010). When looking at the prevalence of obesity as a strong indicator of poor nutrition, it is clear to see that this issue is steadily on the rise, continuing to plague our society with burdens of disease. This burden of disease is also unevenly distributed among minority populations, indicating socioeconomic injustices.

Figure 1: Prevalence of obesity among boys aged 12-19 years by race/ethnicity in the United States 1988-1994 and 2007-2008

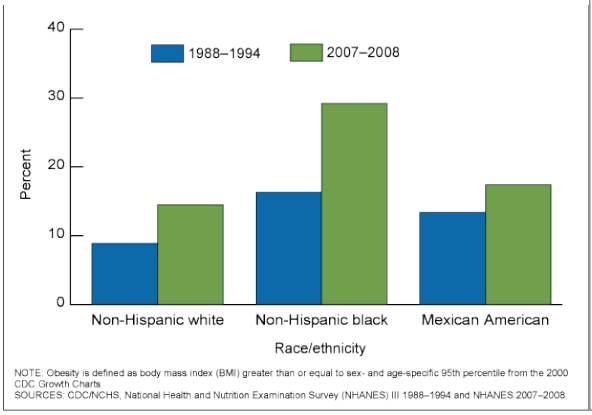
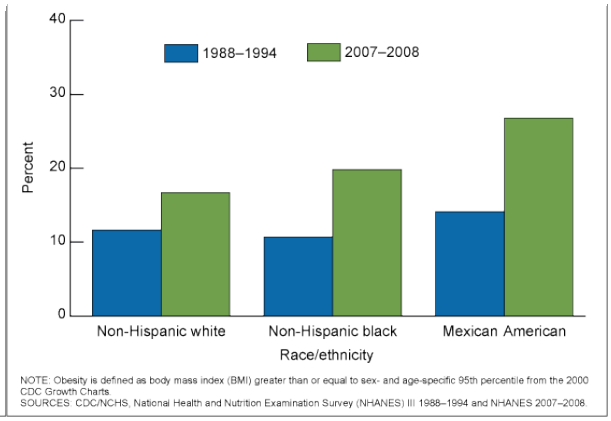


Figure 2: Prevalence of obesity among girls aged 12-19 years by race/ethnicity in the United States 1988-1994 and 2007-2008



Though there is a strong correlation between poor nutrition during childhood and chronic disease during adulthood, children with poor nutrition may experience more immediate effects. It is estimated that over 1 million adolescents meet the criteria for having metabolic syndrome, which is a grouping of traits including hyperinsulinemia[1], obesity, hypertension, and hyperlipidemia[2] (Daniels, Arnett, Eckel, et. al, 2005). Children who experience these symptoms have a much higher risk of developing cardiovascular disease at a much younger age (Daniels et. al, 2005). In congruence with the increased prevalence of youth in our society being overweight, obese and developing a metabolic syndrome, the prevalence of type 2 diabetes has steadily been on the rise, a disease never before seen in children until recent decades (Daniels, et. al, 2005). The prevalence rate for type 2 diabetes is about .42 cases per 1,000 persons; however, pre-diabetic conditions can be found in approximately 20% of adolescents (CDC, MMRW, 2011).

Academic achievement strongly correlates with dietary habits. When a child is supplied with adequate nutrients, brain function, cognition, and memory retention are all improved (Wolpert, 2008). However, higher rates of consumption of saturated fat and trans fat have negative cognitive effects on the brain (Wolpert, 2008). This was demonstrated in a study where students who consumed more fruits and vegetables and had a lower intake of calories from fat were less likely to fail the Elementary Literacy Assessment, a standardized test administered to elementary age students in Nova Scotia, Canada (Daniels et. al, 2005). It is clear that poor nutrition not only has a negative impact on the physical health of an individual, but on the cognitive health as well.

---

[1] Hyperinsulinemia: Elevated, or higher than normal levels of insulin produced by the pancreas or circulating in the blood stream (Grundy et. al, 2004)

[2] Hyperlipidemia: An increase in the amount of fat (such as cholesterol and triglycerides) in the blood. These increases can lead to heart disease and pancreatitus. ("Side effects of," 2005)

Factors

Meals provided across most public schools in the U.S. are required to follow guidelines set forth by the USDA ("National school lunch," 2011). Essentially, the NSLP was developed as an anti-hunger initiative, and therefore had a major objective of supplying meals to needy children. For this reason, the meals were originally required to have a minimum caloric limit; however, no maximum caloric guidelines were ever established. Since the 1940's, when the NSLP was first developed, our needs and knowledge of proper nutrition have changed and developed, yet the regulations regarding school lunches have not (Moss-Coane, 2010). These guidelines usually require for no more than 20-30% of the caloric intake to come from discretionary calories, such as excess fat and added sugars (Gidding et. al, 2005). However, over 70% of the meals provided through the NSLP do not coincide with these guidelines, commonly exceeding limits for fat, saturated fat and sodium (Robert Wood Johnson, 2009). Also, less than 50% of the schools participating in the NSLP supply a fresh produce item on a daily basis (Robert Wood Johnson, 2009).

Another main issue that contributes to the poor nutritional environment of many public schools is the lack of regulation of competitive food items. Competitive food items are any food item sold outside the NSLP, such as a-la-cart items, snack-bar items and foods from vending machines ("National school lunch," 2011). These can be found in nearly 97% of public schools across the U.S. (Robert Wood Johnson, 2009). Competitive food items can benefit schools by generating funds; however, these items usually are calorie dense and of minimal nutritional value, therefore contribute negatively to children's nutritional health (Babey et. al, 2011).

The USDA supplies most public schools with approximately 20% of the food items that are served during school lunches, so one would think that these items would correspond to the recommendations given by the USDA. However, the majority of the food items that the USDA

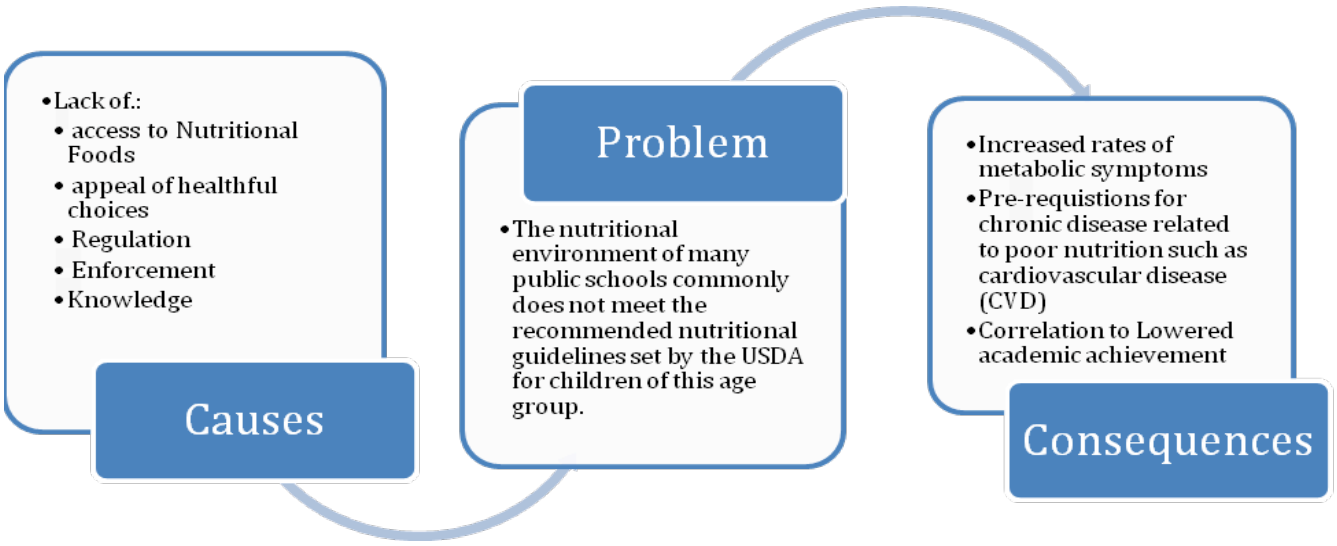
provides to school include meat and dairy products, which are high in fat and saturated fat, and more than half go to a processing facility before reaching schools (Robert Wood Johnson, 2009). The schools are the ones ordering these items, however, the USDA offers very little in the variety of healthful choices, with only 11% of the fruit offered not containing added sugars, only 19% of the grains offered being whole grains and only 13% of the meats offered being described as lean meats (Robert Wood Johnson, 2009). Schools rely on the USDA to supply the food components in order to feed the students, especially schools with high percentages of students participating in the National School Lunch Programs. Schools will have a difficult time providing children with nutritious meals with out the resources and means in doing so.

Many schools do not market the fruits and vegetables that are available in an appealing manner to children; therefore children are not prone to choosing and consuming these items (Burrowes, 2007). It was proven that by simply presenting fresh fruit in an esthetically appealing manner, such as in baskets closer to the check out areas, children are twice as likely to choose these choices (Burrowes, 2007). Also, the schools lack variety for these fruits and vegetables, and do not market them as main components of the meal. A typical lunch menu would look something like this: BBQ rib sandwich, chile quesadilla, refried beans, fresh orange, tortilla chips (see appendix A). Not only does this menu not market the one item of fresh produce, the orange, as a significant part of the meal, but the cafeteria environment also fails to make the small selection of fresh produce esthetically appealing.

Figure 3 below is a representation of the causes and consequences surrounding the poor nutritional environment of many public schools. It is clear from the figure how the factors outlined above constitute to the poor nutritional environments found in schools. This problem is

conducive to many detrimental effects found within our society causing chronic illness and premature death, as exemplified above.

Figure 3: Problem Model



Agency Description

Seaside Middle School strives to create an environment which promotes quality education, tolerance, dignity, respect, healthy and smart life-style choices, and preparation of students for their futures. This will be attained through rigorous, relevant and engaging learning experiences and through collaborative partnerships with parents and community members ("Seaside middle school,"). Seaside Middle School (SMS) is a composed of a diverse population of students, with many different cultural backgrounds, ethnicities and socioeconomic status'. The majority of the students are from a Hispanic heritage. SMS is considered a Title 1 school, meaning that 40% or more of the students are from low-income families considered to be at a

socioeconomic disadvantage. In the case of SMS, about 75% of the students qualify as being at a socioeconomic (SE) disadvantaged. Due to this, about 75% of the students also qualify for the National School Lunch Program (NSLP). The National School Lunch Program was established in 1946 by President Harry Truman (Food and Nutrition Services, 2011). This initiative was signed in order to guarantee that children of low-income families are able to be supplied with a meal while they attended school, either free of cost or for a minimal amount (Food and Nutrition Services, 2011).

Because such a high percentage of students at Seaside Middle School are provided with meals on campus, it is essential that Seaside Middle School supplies foods and fosters an environment, which promotes a healthful diet and proper nutrition. However, this is not the case. The nutritional environment of Seaside Middle School (SMS) commonly does not support the recommended guidelines for children of this age group, often supplying meals that exceed limits for fat and sodium. When investigating the breakfast and lunch menu, it is clearly apparent that many of the meal options provided lack fresh produce, and are already pre-packaged when served to the children. Interestingly enough, though the district will supply a menu, a caloric and nutritional breakdown of the menu is nearly impossible to locate. I was, however, able to locate some of the more distinguishable items on the Internet, which support my claim that the items given lack nutritional adequacy and have very high fat and sodium contents. One such item is a pizza Hotpocket, which, because it does not contain pepperoni, is marketed as "vegetarian" thus implying it is more healthful. One serving of a Hotpocket will supply 390 calories, with 20 grams of fat, 8 grams of saturated fat, and 800 milligrams of sodium. This means that based on a 2,000-calorie diet, which only applies to active children in this age group, a single Hotpocket will supply nearly 31% or the total recommended fat intake, 40% of the recommended saturated

fat intake, and 33% of the recommended sodium intake, while hardly being of much nutritional value.

Alternatives

Our schools can continue to foster poor nutritional environments at the cost of the health of our society. If our schools do so, detrimental health conditions, such as rates of obesity, metabolic syndromes, and type 2 diabetes will continue to perpetuate. We will also continue to see a rise of these conditions in children younger and younger. Poor childhood nutrition is no longer an issue of future health consequences, but an issue concerning the health status of our youth today. We, as a society, cannot afford to ignore this issue, and one way it can be addressed is through the school environment.

In order to truly influence the eating habits of children in our local schools, a holistic approach must be made where children are taught about healthy eating habits, gain experiential knowledge of where food comes from, and ultimately have access to a wide variety of different fresh fruits and produce which is presented in an appealing manner. An ideal way to encompass all these aspects is farm to school initiatives, which have been steadily growing throughout all of the United States. Farm to school initiatives currently take place in 85 school districts around California ranging from economically disadvantaged schools and districts to high-income schools and districts (Joshi & Beery, 2007). These initiatives have proven fruitful as positive impacts in children's health and academics. Also, these initiatives benefit local communities by economically supplementing local farms, which supply the produce to the schools (Hansen, 2003). All in all, they prove to be win-win situations for children, families, schools, and the community at large.

Within our local area, the Community Alliance with Family Farmers (CAFF) currently facilitates many, if not most, farm to school initiatives. CAFF strives to work with in the capacity of the school and the food service budget, which is essential considering SMS is a Title 1 school. However, it must be remembered that low-income and Title 1 schools have had a great success rate of taking on these initiatives in districts such as Pajaro Valley Unified School District in Watsonville, Ravenswood in east Palo Alto, and Oakland Unified ("Farm to", 2011). For this reason, taking on an initiative is extremely feasible for the Monterey County Unified School District. Through this organization, many programs are provided such as:

- Technical Assistance Program
- Meet your Farmer Program
- Harvest of the Month (HOTM)
- Aid in Construction of School Garden

Children cannot only learn about healthy options, healthy options must also be available to them. With advocacy through CAFF, Seaside Middle School can begin the journey for a policy change regarding food service. Under the technical assistance program, CAFF aids schools in the change for implementation of partnerships with local farms to provide food service. It is a common misconception that even if schools supply healthful choices, children will still choose the unhealthy foods. This is not the case. In actuality, children will increase their intake when offered a variety of fresh produce in an appealing manner. During a case study conducted at three elementary schools in the Los Angeles Unified School District, children more than doubled their intake of fresh fruits and vegetables when offered a simple salad bar during lunch (Albino, 2007). The schools were low-income title 1 schools, with at least 40% of students participating in the NSLP. Children received a nutritional education component, and the produce

offered was local and farm-fresh (Albino, 2007). By teaching kids the knowledge of nutrition then also empowering them by giving them a choice of what to eat, kids will choose healthful options and actually consume them. Advocacy for this program is a viable alternative to address this issue.

Interactive activities are the best way in which children can begin to understand and appreciate the benefit of real, fresh food. Interactive programs can include field trips to agricultural farms, presentations by agricultural farmers, and also school gardens. Interactive education and activities, which incorporate agriculture and gardening, have proven to positively impact the eating habits of school age children on multiple levels. Children who have participated in interactive activities such as school gardens have reported consuming a greater variety of vegetables, eating fresh produce more frequently, and eating a greater variety of fresh produce in the school lunch room (Ratcliffe, Merrigan, Rogers & Goldberg, 2009). As stated through the research done by Ratcliffe et. al (2009) the increase in variety and frequency could also be due to the increase availability of the fresh produce due to the garden. This just goes to prove once again that interaction combined with knowledge and availability can drastically improve eating habits of all children.

Justification

An effective tactic in improving the nutrition of school age children is repeat exposure to healthful choices, and also exposure to new and interesting foods. An additional aspect of the farm-to-school initiative is a Harvest of the Month program. With this program, for about 50 cents a child, a tasting kit will be sent to each classroom with a sufficient amount of the in-season produce for each child to sample each month ("Harvest of the," 2011). The kit also comes with teaching materials so that the harvest can be incorporated into the learning

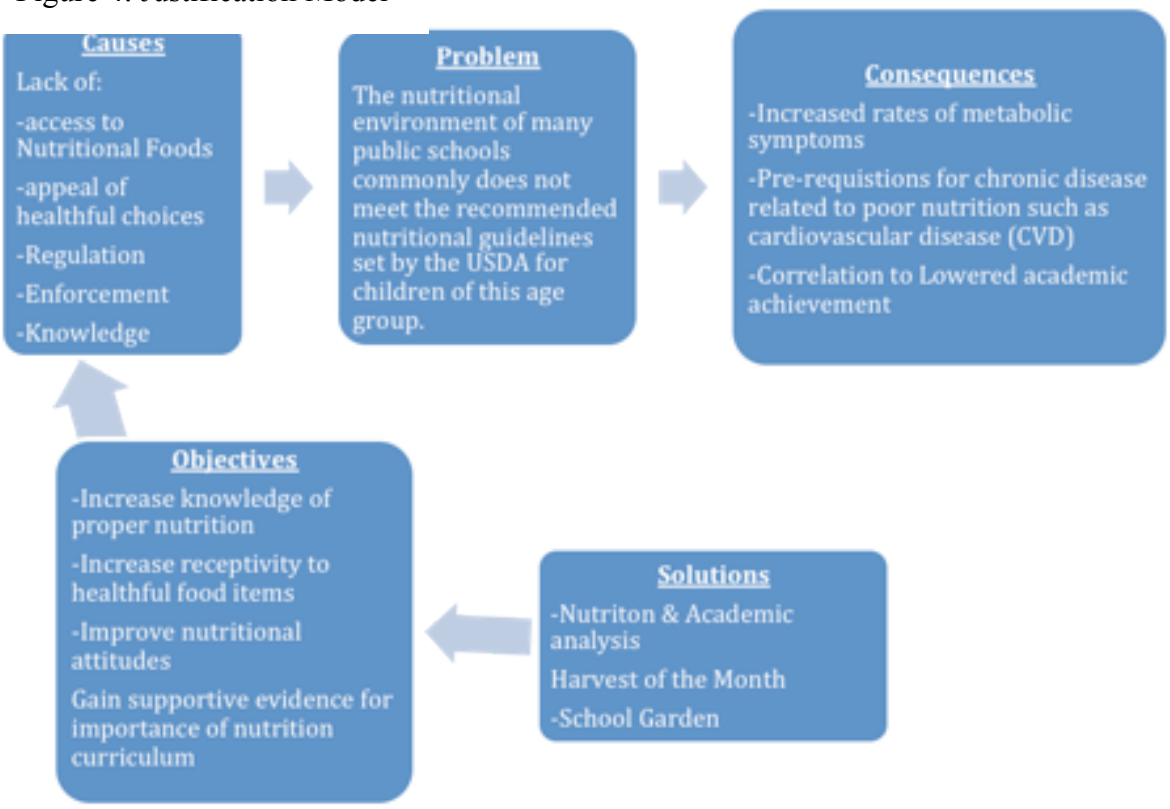
environment. This provides a fun and interactive way for children to be exposed to produce they may not ever have the chance to try. This program is already instated in several schools in our area, including Lincoln Elementary School located in Salinas. A teacher at Lincoln notes, "After my class started the Harvest of the Month program, my students are excited about eating more fresh fruits and vegetables," ("Harvest," 2011). By simply exposing children to more fresh produce causes them to have knowledge of and willingness to try new and healthful choices, which children can even bring back and promote into their family settings. This program is an affordable way to positively impact the eating habits of children at SMS.

School gardens have proven to be an effective way for children to gain knowledge through first hand interaction about healthful foods and nutrition. Many grants are available for school gardens, and California State University Monterey Bay (CSUMB) already had partnerships with several schools and has worked with several programs to implement gardens at local schools in our area (*School gardens*, 2010). One way in which I can impact the nutritional environment of Seaside Middle School would be to assist in facilitating a school garden on the grounds of Seaside Middle School. School gardens have proven to be an interactive way in which children can learn about new fruits and vegetables as well as supplement the foods offered in the cafeteria ("Garden Based," n.d.?). When children understand how produce is grown, they also begin to understand the magnitude of putting fresh, real food in their bodies. Children will feel proud and empowered by being able to create something sustainable and will be more willing and accepting to healthier eating habits ("Garden Based," n.d.).

Figure 4 below is a representation of how the solutions will address some of the factors contributing to the poor nutritional environment of Seaside Middle School. The main objectives of implementing the Harvest of the Month program and the school garden is to increase

knowledge of proper nutrition, increase receptivity of healthful food items, and improve the overall attitudes towards nutrition throughout the school. Implementing the HOTM and the school garden at SMS is the first step in beginning a partnership with CAFF and bringing the Farm to School initiative to the school. This is also the first step in the social justice movement of creating just food policies in public schools.

Figure 4: Justification Model



Implementation Plan

A holistic approach to improving the nutritional environment of SMS is proven to be the most influential to improving the nutritional habits of students (Rauzon et. al, 2010). Students must not only have access to healthful choices, but also have the knowledge base and understanding to choose and consume these options. The faculty must also understand the importance of nutrition in the context of better cognitive skill and academic achievement.

Finally, children must have interactive learning experiences along with a physical environment that supports ideals of proper nutrition. In order to encompass these elements, I chose three different approaches to begin improving the nutritional environment of SMS. First, I conducted a nutritional survey that analyzed eating habits and knowledge along with academic achievement. Second, I began a pilot program of the Harvest of the Month program in a single 6th grade class, which was then expanded to additional classrooms. Third, I assisted the counselor at SMS, Greg Jordan, in applying for funding to receive a fruit tree orchard. The accumulated information was then presented to the faculty at SMS in order to gain support towards an improved nutritional environment. By applying these three approaches, the goal of creating an improved nutritional environment conducive to learning and preparation for real-life choices regarding health and nutrition was realized.

Nutrition and Academic Analysis

Implementation

- **Objective 1**:Gain data to analyze for a correlation between eating habits and academic achievement at SMS.
- **Objective 2**: Present data as evidence to support importance of nutrition in academic achievement for students at SMS.

Through multiple studies, correlations have been made that support the fact that nutrition impacts academic achievement of school age children, thus better nutrition, better academic achievement (Daniels, et. al, 2005). In support that this claim also holds true for the students at SMS, I have generated and conducted surveys, which measure the basic nutritional habits of

students at SMS, their basic knowledge of nutrition, and also their opinions about the food in the cafeteria and how it could be improved. (See appendix C).

We wanted the surveys to be in the 95 percentile for accuracy. The total number of students currently attending SMS is 786; therefore we needed to survey approximately 258 children to gain this accuracy. We took a list of the entire school, randomized the list, and chose the top 268 students on the list. We chose a few extra in order to assure our standard of error would remain correct for inevitably some students will be absent, or some parents will not want their children to partake in the survey. We decided the best time for the students to take the survey would be during their physical education class, so we organized the list accordingly. We created parental consent forms in both English and Spanish, and on Friday, November 4th, the consent forms were dispersed to the appropriate students. (See appendix B). The following Tuesday, November 8th, I administered the surveys throughout the day during the student's Physical Education classes. I informed the students that the information was for my knowledge and they would not be graded on their answers, and urged them to answer truly and to the best of their abilities. About 250 students were surveyed in all.

The next step in this process was to analyze the survey results with the academic abilities of the students. The answers for the surveys have been given an accumulative score, which represents their nutritional habits. The surveys were also given another accumulative score, which represents the students' nutritional knowledge. The over-all grade point averages (GPA) of the students were correlated with the score for their habits and knowledge, along with other information such as grade level, gender and whether or not they are English learners.

On the survey is also a section which asks how often they eat in the cafeteria at school, if they like the food or not, why, and what improvements or suggestions they have. I believe this

part is essential, for the students are the primary stakeholders in this situation therefore their opinions surrounding the food offered must be taken into consideration.

After the data was compiled and analyzed, the results were presented to faculty at SMS. Along with the presentation of these results, results from the other components were presented as well. Funding ideas and resources were also dispersed through the presentation.

Results

A positive relationship between eating habits and overall GPA was represented through the nutritional survey. This represents a correlation between the nutritional habits of the sample population and their over-all GPA scores. The correlation is positive, showing that better nutritional habits positively correlate to higher GPA scores. An increase of 10 points for nutritional habits correlates to .1 GPA point. It must be noted that nutritional habits are not causal to GPA scores, but only that there is a correlation; other alternatives may be influencing both (income, parenting, etc.). (See Appendix D, Figure 5)

The relationship between eating habits and GPA was still present when the population group was separated between English Learners and Non-English Learners. (See Appendix D, Figure 6 and 7) This is important to note for it demonstrates a relationship despite other factors such as culture and perhaps socioeconomic status. Still it must be stressed that alternative factors can affect this relationship as well, and a correlation is only present, not a causal relationship.

The relationship between nutritional knowledge and eating habits is also present, with a positive correlation; therefore meaning higher scores for nutritional knowledge correlate to higher scores for eating habits. This can perhaps reflect that increased nutritional knowledge can positively influence eating habits. (See Appendix D, figure 8) Please note, neither variable is the causation of the other, for other alternatives can be factors affecting both.

The scores for nutritional knowledge and GPA also presented a relationship, with a positive correlation between higher GPAs and higher scores for nutritional knowledge. (See Appendix D, Figure 9) We can infer a few reasons for this, including those who have higher GPAs may also have had more exposure to nutrition education.

The students had varying opinions and suggestions surrounding the food options offered on campus. However, a common response was for more fresh foods, including more options of fresh fruits and vegetables. This proves that the students are aware and have an opinion of the food options offered. Also this represents the need for more fresh, healthful options for students. Their opinions must be acknowledged, especially when it is a high demand for healthful choices.

Limitations

Though this analysis is an interesting representation of the relationship between eating habits, nutritional knowledge and academic achievement, it is inconclusive data. We cannot fully make connections between these relationships, for various other factors can affect all variables. Also, the survey created may contain subjective questions or questions which were unclear for the respondent. Due to this, the survey may not accurately represent eating habits and/or nutritional knowledge. For this reason, conclusive data is limited from this analysis.

Harvest of the Month

Implementation

The goal of the Harvest of the Month (HOTM) program is to positively influence the eating habits of the students participating and to create an improved nutritional environment of the school by constant messages and access of healthful foods. Through the HOTM program, children are introduced to a new fruit or vegetable every month. With this introduction, children learn the nutritional value of the produce, basic facts about the item, benefits of consuming the

fruit or vegetable, fun and historical facts about the featured item and also a chance to sample the fruit or vegetable. The fruit or vegetable may also be seen on the menu of the cafeteria, thus creating a foundation of knowledge with an opportunity to choose and consume the produce. Their new knowledge and willingness to consume the fresh produce can even transfuse to their friends and families, creating a healthier society. The goal of positively influencing eating habits by an improved nutritional environment is attained by participating students demonstrating:

- **Objective 1**: 20% higher scores for nutritional knowledge compared to students who did not receive the program (control) after the three-month period.

  One way to positively influence the eating habits of children is to increase their knowledge of proper nutrition and the benefits of eating a healthful diet. The HOTM program increases this knowledge by teaching children the nutritional benefits of eating the featured fruit or vegetable in a fun and interactive way. Along with facts about the featured produce, students will also learn of other produce within the same family, thus the benefits of eating all of the produce within that particular family.

- **Objective 2**: 10% higher scores of familiarity and preference of 30 varieties of fresh produce compared to the control group after the three-month period.

  In order for children to improve their eating habits, they must be receptive and willing to eat fresh fruit and vegetables. The HOTM program provides an opportunity for students to try a variety of fresh produce, some they are familiar with, and some that is new to them. In the tasting kit, more than one variety of the featured fruit or vegetable is provided thus giving the students the opportunity to compare and contrast, and decide which they like better. When children have the opportunity of trying new foods, they become more familiar with the foods featured in the HOTM, thus perhaps choosing them

in other circumstances. Also, by being exposed to new foods, they may become more willing to try other types of fruits and vegetables, perhaps ones that were taught about or are in the same family as the featured item.

- **Objective 3**: 20% higher scores for self-efficacy of choosing fresh fruits and vegetables supplementary to meals or in place of snacks compared to the control group after the three-month period.

  When students are taught the benefits of eating healthier food choices along with having access to sample a variety of fresh food choices, they understand their ability to make healthier choices. The HOTM program allows children to realize their abilities to choose to consume fresh fruits and vegetables by allowing them to try the item then reflect on if they can choose the item at another time. Doing this allows the students to understand that they have a choice to consume fresh fruits and vegetables.
- **Objective 4**: Consumption of at least one serving more of fruit and one serving more of vegetables within the last 24 hours compared with the control group.

  By teaching students the benefits of eating fruits and vegetables and also allowing for the opportunity to sample these items, students are more likely to consume more fresh fruits and vegetables.

In order to implement the Harvest of the Month (HOTM) program further throughout the school, a pilot program was first established in one classroom. This demonstrated the benefit and effectiveness of HOTM so it may be further adopted by the school. In mid November I met with Kathryn Spencer, the regional program director of Community Alliance with Family Farmers (CAFF). In our meeting, we agreed upon starting this pilot program in January and

continuing through March. The cost was $45, and the program was implemented in a 6th grade science class the first Wednesday of each month. To cover the cost, I applied for the alumni capstone grant in November, and received confirmation that I had been awarded the grant in December.

The first HOTM began on Thursday, January 13th, 2012 and the first featured item was cabbage. Two varieties of cabbage were supplied: two heads of red cabbage, and two heads of savoy cabbage. The lesson took about an hour, and consisted of the students learning facts about the cabbage, exploring the different parts of the cabbage, comparing and contrasting the cabbage and doing a taste test. At the end, the children were able to eat a simple salad which was previously prepared. Their over-all reaction to the lesson was enthusiasm and eagerness, and all the students at least sampled the cabbage that day.

February's featured item was citrus fruit, and the tasting kit contained two types of citrus fruit, including mandarin oranges and cara cara oranges. The HOTM lesson plan was taught on Wednesday, February 8th, and was a shorter lesson of about a half hour. This lesson consisted of introduction and facts about the fruit then the students doing a scientific observation comparing and contrasting the two fruit. In the end, they were able to consume the fruit. Once again the overall experience was very positive with the students being engaged and receptive to the produce.

The featured item for March was cauliflower, and three varieties were provided in the tasting kit: white, purple and cheddar (orange-yellow coloring). The HOTM lesson was conducted on March 14th, and included a nutritional lesson, an exploratory activity where the students were able to observe and examine the different varieties, then ultimately a taste test to try the different versions of cauliflower. Most students had only experienced the common white

version, so having the other varieties proved exciting and created enthusiasm over trying the item. The same eagerness was present during this lesson as was common in the others.

March was the end of the pilot program. However due to the program being such a great success, the teacher whose class I conducted the pilot program through decided to continue the program for the remainder of the year of April and May. In order for Seaside Middle School to see a substantiated difference in the meal environment and eating habits of the student, the HOTM program must be adopted by a number of classes. Sixth-grade science classes have proven to be an ideal environment for the HOTM program, for the activities in the tasting kit correlate with 6th grade learning levels. When the program was presented to the other 6th grade math and science teachers, 3 others decided to begin the program for the months of April and May. The teachers were able to receive funding for the program through the school's Parents, Teachers, Students Association (PTSA). Through the months of April and May, I have facilitated the HOTM program for these additional classes. Hopefully by the other teachers having the opportunity to participate in the HOTM program will create enough support and enthusiasm for the program to continue for the following year and be further implemented.

Obstacles/Limitations

One of the main obstacles with further implementation of the HOTM program is funding. The program is very affordable, but in an already resource poor community, it is sometimes difficult to get buy-in from administrators or parents. The school itself does not have extra monetary funds for the program. Grants and subsidies are given to low-income or resource poor schools to supplement programs that promote fresh, local produce in schools, such as the fresh fruits and vegetables grant ("Information alert: Fresh fruit," 2011). However, this grant is only awarded to elementary schools, thus there is still a lack of funding for programs such as the

HOTM or other initiatives to improve the nutritional environment ("Information alert: Fresh fruit," 2011). Despite these barriers, fundraising is still an option to further implement the HOTM program, for it is extremely affordable at only $.50 a student per month. An obstacle that was encountered was funding to further implement the HOTM in the additional classes. However, due to the program falling in the framework of wellness, the PTSA could pay for the program.

Evaluation

Design

The HOTM program was evaluated both quantitatively and qualitatively for there are a variety of aspects, which must be taken into account to measure the success of the program. Surveys were administered to the class who received the program, identified as the intervention group. (See Appendix E) The same surveys were also administered to a control group, a class that did not receive the program. The control group was the same teacher's other section for math and science; therefore the results can be compared. The survey has an array of questions on areas such as basic nutritional knowledge, familiarity and preference of different fruits and vegetables, self-efficacy of consuming fresh produce supplementary to meals or in place of unhealthy snacks, and also a reported behavior section of the amount of servings of fruits and vegetables consumed within the last 24 hrs. Each section had a certain amount of points available, and the scores were accumulated for each section. This supplied quantitative data, which could then be compared between the two groups. Also, qualitative data was collected by requiring the intervention group to write a sentence of two of something they like, learned or remembered from participating in the program.

One limitation that was encountered with the evaluations was not being able to compare pre survey results with post survey results for the intervention group. Originally, pre surveys were administered, however, due to miscommunications, the pre surveys were misplaced and never located. Having these results would have been more conclusive of the direct impact of the program.

Evaluation Results

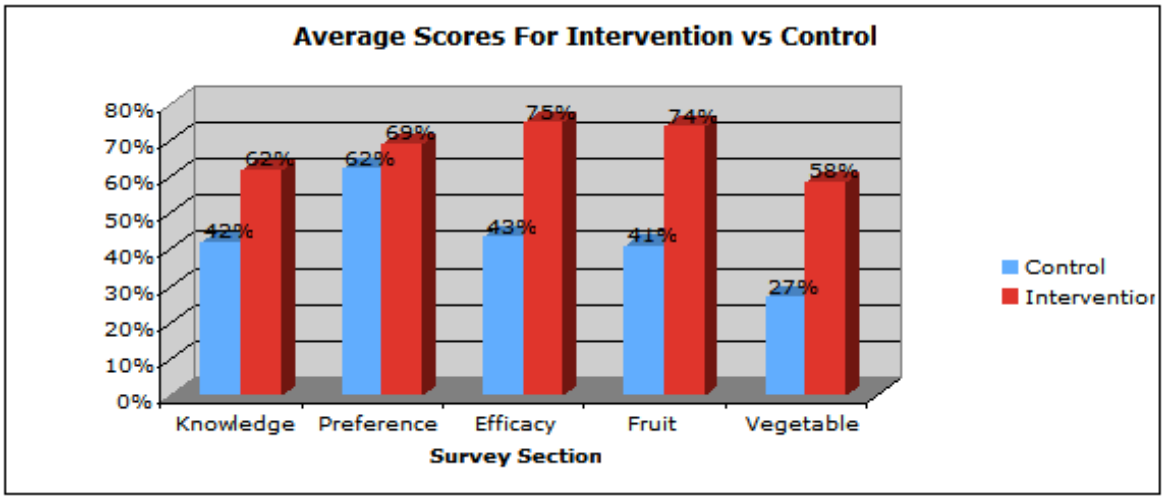
The group that received the intervention scored substantially higher on all sections of the survey than did the control group, as demonstrated in figure 5 below. The knowledge section of the survey consisted of 5 questions, which evaluated basic nutritional knowledge of fruits and vegetables. On average, the intervention group scored a 3.08 out of 5, while the control group had an average score of 2.1 out of 5, a 20% higher score for the intervention group. Therefore, on average, the group who received the intervention had been able to answer 20% more questions regarding basic nutritional knowledge correctly than the group who didn't, demonstrating an increased nutritional knowledge.

The preference and familiarity section assessed whether the student was familiar with and liked 30 different items of fresh produce. The students could score up to 3 points per item, with a total score consisting of 90 points. A score of 0 meant the student did not know what the item was, while a score of 1-3 assessed the preference towards that item of one being the lowest and 3 being the highest. The average score for the control group was 55.76 while the average score for the intervention group was 62.19, with the intervention group scoring 7% higher than the control group. Also, students in the intervention group consistently scored items that were featured during the program higher than the control group.

The self-efficacy section assessed whether or not the student believed he or she could consume an item of produce along with a meal or in place of an unhealthy snack. There were a total of 13 questions in this section, with the score ranging from 0 for strongly disagreeing to 4 for agreeing strongly. The total number of points available was 52. The control group scored an average of 22.52 while the intervention group scored an average of 38.88, which is 32% higher than the control group. Self-efficacy is extremely important in improving nutritional habits for if a participant believes they can make a better choice, they are more likely to do so.

Higher rates of consumption of fruits and vegetables are ultimate outcome of the HOTM program, and the intervention group demonstrated this. The behavior section asked the participants to self-report the amount of servings of fruit and, separately, vegetables that had been consumed within the last 24 hrs. The control group reported consuming an average of 2 servings of fruit while the intervention group reported consuming an average 3.68 servings of fruit, a 33% difference. Also, the control group reported eating only an average of 1.35 servings of vegetables, while the intervention reported consuming an average of about 3 servings of vegetables, a 31% difference. Also, within the intervention, about 92% of participants reported eating at least 2 servings of fruit within the past 24hr, compared to 75% of the control group, and about 88% of participants in the intervention group reported at least 2 servings of vegetables within the past 24hrs compared to only 40% of the control group. (Refer to Appendix F).

Figure 5:



Discussion of Results

The Harvest of the Month program proved to be effective in creating a nutritional environment, which supports the ideals of a healthy diet. The program positively influenced attitudes and beliefs towards proper nutrition by educating the participants through an interactive curriculum. The students received the opportunity to experience new items of produce and the nutritional benefits of consuming them. This not only increased their knowledge base of nutrition, but also improved their ability to make healthier choices. The ultimate goal of creating an improved nutritional environment is to positively influence the eating habits of the participants. This was proven to happen within this intervention, for the intervention group reported consuming significantly more servings of fruits and vegetables than did the control group.

Fruit Tree Orchard

School gardens have proven to be an effective way for children to gain knowledge through first hand interaction to learn about new fruits and vegetables. Gardens can also supplement the foods offered in the cafeteria ("Garden Based," n.d.?). When children understand how produce is grown, they also begin to understand the magnitude of putting fresh, real food in their bodies. Children will feel proud and empowered by being able to create something sustainable and will be more willing and accepting to healthier eating habits ("Garden Based," n.d.). For this reason, in collaboration with the counselor at SMS, Greg Jordan, we have started the process of beginning to implement a school garden, specifically a fruit tree orchard. Not only would this create the physical grounds of the school to be more esthetically pleasing, but would also create a physical environment which would support the ideals of a healthful diet.

Currently we are only in the beginning process for this aspect of improving the nutritional environment. In November, Mr. Jordan applied for a grant through the organization The Tree Planting Foundation, which would provide all the necessary supplies to start a fruit tree orchard including trees, mulching, and an agricultural designer. Prior to applying, we had measured and plotted the school grounds to devise an architectural plan for a garden. We also have consulted several agriculturalist in regards to which plant species will grow successfully in this climate. With this information, a layout for the garden was devised, which was added to the grant proposal.

The organization is a large organization funding many such projects across the U.S. Due to this, the waitlist time is several years. However, the organization did contact Mr. Jordan to inform him that the school could be entered into a nationwide competition to win called

Communities Take Root. The competition is a collaboration between Dreyer's Fruit Bars and The Tree Planting Foundation in which votes are submitted daily online for each competitor. There are four voting periods, and the first one ends at the end of May. If the school qualifies in at least 5th place by May 29th, the school will receive an entire fruit tree orchard in the fall. Currently we have been trying to gain us much support as possible to qualify to win the orchard by promoting the competition on the campus of SMS and throughout the community. I have also been seeking the support from the California State University Monterey Bay (CSUMB) community through classes, emails and throughout campus. Although there are three other voting periods after this first one, due to both SMS being out of school for the summer and CSUMB being out of school, momentum may be lost after this first voting period if the school does not qualify.

Whether the school wins the Communities Take Root competition or not, the process of implementing a garden has been initiated. For just competing in the competition, the school will receive 3 fruit trees along with other minimal necessary supplies. Also, the school will remain on the waiting list to receive the orchard eventually. On top of having the possibility of receiving a fruit tree orchard within this year, the competition has also started conversation and enthusiasm about the possibility of having an interactive and comprehensive learning environment through a garden. This learning environment would benefit the students in health through teachings of wellness and nutrition, but would also benefit many other subject areas, such as science, along with beautifying the school grounds. This would be an amazing opportunity for SMS, usually an underprivileged school, to be a leader at the forefront of creating comprehensive environments, which support healthy lifestyles.

Limitations

It has been difficult gaining enough support for this first round of voting mainly due to the fact that many of the students within SMS do not have access to technology to vote once they leave the school grounds. Parental involvement and communication has still been a barrier in promoting the competition to win a fruit tree orchard. Also, issues surrounding sustainability and a nutrition curriculum may also need to be considered if and when the school receives a fruit tree orchard.

Conclusion and Recommendations

Conclusion

Through implementing the project of improving the nutritional environment of Seaside Middle School, positive change has started to occur surrounding awareness of opportunities to implement a wellness curriculum. Our food system, both within schools, and within the generally community, can have very negative consequences of the health of our society. However, we are currently in a time of awareness and opportunity to improve these food systems, or at least improve knowledge and attitudes surrounding diet and nutrition. Middle school students are at a crucial age where they are beginning to make more decisions and take more control in their own lives, either for the better or the worse. Social pressures to fit in are also high, thus many decisions are made not necessarily by what's better for the individual, but what the social environment deems acceptable. For this reason, it is essential that the attitudes surrounding healthy eating are positive, so our society can begin the transformation from having marketed unhealthy items being popular, to wholesome, nutritious foods, such as fresh produce,

being the norm. The Harvest of the Month was able to influence attitudes and values surrounding nutrition by involving the entire class in an interactive lesson. By the end of the lesson, the entire class would be more open and eager to consume the fresh produce item. This can have a lasting effect throughout their lives. Other teachers were also able to participate for the remainder of the school year, thus influencing attitudes and values of more students. Also, since the teachers had the opportunity to experience the HOTM program, they will hopefully continue the program the following academic year.

Through my time at SMS this year, the initial foundation to create a comprehensive and positive nutritional environment has been set. An easy and affordable nutrition curriculum has already been started, creating a connection between CAFF, a leader in the farm to school initiative, and SMS. This program has also been funded through the PTSA for several classes, so sustainability is a possibility. Also, the groundwork and foundation to eventually receive a fruit tree orchard has been established as well. Though neither Greg nor I Jordan may be around to see the final orchard at the school, we have started the process, which is a promising opportunity for SMS. Statistical data to support the claim of a correlation between academic achievement and nutrition has also been established at this particular school. These are all progressive steps towards change, which will eventually result in an environment that supports the ideals of health and wellness through a comprehensive and interactive curriculum conducive to proper nutrition and a healthy lifestyle.

Recommendations

Though progress has been made at SMS regarding the nutritional environment, more can be done to continue this improvement. Several recommendations would allow the school to

sustain the progress made and move forward to an over-all improved environment, which supports ideals of wellness and good nutrition.

- Continue the Harvest of the Month Program- the HOTM program is effective, affordable and fun and perfectly tailored to middle school level science and learning capabilities. This is an easy way to implement a comprehensive nutrition curriculum that greatly influences the knowledge, attitudes, beliefs and behaviors around health eating.
- Pursue funding methods for nutrition and wellness curriculum-many funding methods are available to fund the HOTM program and also other nutrition, gardening, and wellness curriculum. The HOTM falls into the framework to be funded by the PTSA. Other options include small school-based grants, and donor programs. (See Appendix G for a list of some funding options)
- Utilize wellness committee to implement wellness policy/curriculum-all schools were mandated to create a wellness committee in order to implement a wellness policy for the students at the school. The wellness committee can begin to take initiative to implement a policy with regards to nutrition curriculum, either through the HOTM or complementary to the future orchard.
- Create a sustainability plan for fruit tree orchard-if and when the school receives the fruit tree orchard, it is essential that the school devises a sustainability plan to maintain the orchard on the school grounds. This can be done be assigning classes schedules to maintain the orchard.

CHHS Major Learning Outcomes

- **Statistics and Research Methods**: A major component of the project was a reliance on the use of research methods and statistical analysis. In order to conduct the analysis of a correlation between eating habits, nutritional knowledge and academic achievement, I used the skills of ethical and relevant research methods. I did this through creating a basic survey to measure health behaviors and knowledge within a certain population. I then was able to statistically analyze the results by generating data which exhibited correlations between alternatives. This information can then be used as a relevant representation of the population of Seaside Middle School to be used for program planning and funding allocation.
- **Leadership**: Throughout the semester, leadership skills were exhibited through both the project of improving the nutritional environment and throughout the internship experience. The knowledge of leadership was utilized by first questioning the status of the nutritional environment at SMS, and what implications having a poor nutritional environment had on the students. Then in collaboration with several other key stakeholders (teachers, the nutrition director of the district, counselors and the principle) a program to begin addressing this issue was facilitated. Additional leadership skills were demonstrated when other teachers were informed and encouraged to participate in the HOTM program. Additionally, leadership was established by presenting findings from both the HOTM and the nutritional and academic analysis to the faculty and advocating for additional change and implementation of nutrition programs.
- **Financial Management**: Funding was a crucial aspect for the success of this project along with allowing for sustainability of the future of the nutritional environment of the school. As SMS is a low-income school, understanding was gained as to the difficulty of allocating scarce resources for projects such as the one implemented. Throughout the semester,

knowledge was gained through researching and pursuing available funding options to implement both the Harvest of the Month and the Fruit Tree Orchard. An operational budget was generated for the HOTM program and with this I was able to receive funding through the Capstone Grant from the Alumni Association of California State University, Monterey Bay. A prospective budget was also generated for the following year, along with a hypothetical grant application which the school may use to receive funding to sustain the program.

University Vision

The California State University Monterey Bay (CSUMB) community strives to become part of and serve the local community at large by integration, respect and meaningful service opportunities. The vision of CSUMB is to provide a comprehensive education through service, especially in regards to the unique and diverse population within the tri-county region. CSUMB fosters ideals of tolerance, equity, multiculturalism and pluralism. By addressing the issue of a poor nutritional environment at a local, underprivileged school, a disparity is realized and confronted. This benefits the local community while providing a comprehensive and meaningful academic and professional experience in which real-life issues are realized and attended to. Partnerships are also made throughout the community that extend beyond the academic setting, integrating the CSUMB community with the surrounding area.

Final Thoughts

The capstone process has made me realize both my capacity and my capability of being an entry level professional within the health and human services. Though the process was not always easy, it provided me with the opportunity to apply my academic knowledge-base in real-world settings, preparing me for my future career. Throughout the process, the basics of identifying a community issue along with contributing factors and consequences were acquired. I also attained skills in networking and utilizing available resources to accomplish a task or

provide a service or program. I realized my capability of initiating change for the school, however I also realized my limitations. Throughout any pursuit in the field of health and human services, barriers will present themselves, and knowing ones capacity to overcome these must also be met with acknowledgement of limitations. Knowing one's limitations allows for more creative means of accomplishing a task while not becoming discouraged that the task didn't go as planned.

This was reflected throughout the capstone process as barriers and limitations presented themselves. However, thanks to a very supportive network of professors and professionals, I was able to accomplish my capstone project of improving the nutritional environment of SMS. With their support, I was able to achieve me capacity of bringing a nutritional program to the school while advocating for further change. A special thanks to my internship mentor for always being supportive and enthusiastic about the project; with both of our efforts, we have made a difference in the school. Also, a very special thanks to my professors and advisors for assisting me throughout the yearlong process and giving me the professional and academic knowledge and support to complete this project and prepare me for my future career. I must also give a special thanks to my fellow classmates for our many sleepless nights in the library, keeping each other motivated through this challenging senior year. Lastly, but certainly not least, a very special acknowledgement to my family who have supported me throughout this entire process, believing in all that I can do. Thank you.

Reference

Babey, S., Wolstein, J., Diamont, A. L., Bloom, A., & Goldstein, H. California Center for Public Health Advocacy, (2011). *A patchwork of progress: Changes in overweight and obesity among California 5th, 7th, and 9th graders, 2005-2010* . Retrieved from UCLA Centers for Health Policy Research website: http://www.healthpolicy.ucla.edu/pubs/files/PatchworkStudy.pdf

Brown, J. E., Isaacs, J. S., Krinke, U. B., lechtenberg, E., & Murtaugh, M. A. (2008). Adolescent nutrition. In J. Stang, S. Feldman & M. Story (Eds.), *Nutrition Through the Life Cycle* (pp. 354-405). Belmont: Wadsworth Cengage Learning

Centers for Disease Control and Prevention. *School health guidelines to promote healthy eating and physical activity*. MMWR 2011;60(No. 5):1-80.

California Department of Education, Nutrtion Services Division. (2011). *Information alert:fresh fruit and vegetable program*. Retrieved from California Department of Education website: http://www.cde.ca.gov/ls/nu/sn/iaffvp10.asp

Community Alliance with Family Farmers , (2011). *Farm to School*. Retrieved from http://caff.org/programs/farm-2-school/

Community Alliance with Family Farmers , (2011). *Harvest of the month tasting kit*. Retrieved from http://caff.org/programs/farm-2-school/harvest-of-the-month-tasting-kits/

Daniels, S. T., Arnett, D. K., Eckel, R. H., Gidding, S. S., Hayman, L. L., Kumanyika, S., Robinson, T. N., & Scott, B. J. (2005). Overweight in children and adolescents: Pathophysiology, consequences, treatment and prevention. *Circulation*, *111*, 1999-2012. doi: 10.1161/01.CIR.0000161369.71722.10

Finkelstein, D. M., Hill, E. L., & Whitaker, R. C. (2008). School food environments and policies in us public schools. *Pediatrics*, *122*(1), 251-259. doi: 10.1542/peds.2007-2814

Florence, M. D., Asbridge, M., & Veugelers, P. J. (2008). Diet Quality and Academic Performance. Journal Of School Health, 78(4), 209-215. doi:10.1111/j.1746-1561.2008.00288.x

Garden based learning working group. (n.d.). Retrieved from http://www.csgn.org/images/pdf/nutritionbrief.pdf

Gordon, A., & Fox, M. (2007). *School nutrition dietary assessment study-iii summary of findings*. Retrieved from U.S. Department of Agriculture, Food and Nutrition Services website: http://www.fns.usda.gov/ora/menu/published/CNP/FILES/SNDAIII-SummaryofFindings.pdf

Grundy, S. M., Brewer, B., Cleeman, J. I., Smith, S. C., & Lenfant, C. (2004). *Definition of metabolic syndrome: Report of the national heart, lung, and blood institute/americ*. Paper presented at American heart association conference on scientific issues doi: 10.1161/01.CIR.0000111245.75752.C6

Hanson, K. U.S. Department of Agriculture, Economic Research service. (2003). *Importance of child nutrition programs to agriculture* (FANRR34-12) Retrieved from http://www.ers.usda.gov/Publications/FANRR34/FANRR34-12/

Moss-Coane, Marty, perf. "School Lunches:From Mystery Meat to a Healthier Fare." *Radio Times*. WHYY Radio: 10 May 2010. Web. 29 Nov 2011. <http://whyy.org/cms/radiotimes/2010/05/10/school-lunches-from-mystery-meat-to-healthier-fare/>.

National school lunch program fact sheet. (2011) Retrieved from Food & Nutrition Service Home Page website: http://www.fns.usda.gov/cnd/Lunch/AboutLunch/NSLPFactSheet.pdf

Ogden, C., & Carroll, M. (2010). *Health e stats - overweight prevalence among children and adolescents 2007-2008*. Retrieved from Centers for Disease Control and Prevention website: http://www.cdc.gov/nchs/data/hestat/obesity_child_07_08/obesity_child_07_08.htm

Rauzon, S., Wang, M., Studer, N., & Crawford, P. College of Natural Resources and School of Public Health, The Dr. Robert C. and Veronica Atkins Center for Weight and Health. (2010). Evaluation of the school lunch initiative: changing students' knowledge, attitudes, and behavior in relation to food . Berkely, CA: University of California at Berkeley.

Reedy, J., & Krebs-Smith, S. M. (2010). Dietary sources of energy, solid fats, and added sugars among children and adolescents in the United States. *Journal of the American Dietetic Association*, *110*(10), 1477-1484. Retrieved from http://www.sciencedirect.com.library2.csumb.edu:2048/science/article/pii/S0002822310011892

Robert Wood Johnson Foundation (2009, February). *Improving Child Nutrition Policy: Insights from National USDA Study of School Food Environments.* Retrieved from http://www.rwjf.org/files/research/20090427sndapolicybriefrev.pdf

Wechsler, H., McKenna, M. L., Lee, S. M., & Dietz, The State Education Standard, National Association of State Boards of Education. (2004). *The role of schools in preventing childhood obesity*

Wolpert, S. (2008). What you eat affects you brain-and those of children. *Foodlines for Professionals*, *7*(6), 4. Retrieved from http://newsroom.ucla.edu/portal/ucla/scientists-learn-how-food-affects-52668.aspx

Appendix A: Seaside Middle School October Menu

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
3 Ultimate Breakfast Round *** BBQ Sandwich# Chili Quesadilla* Applesauce Baby Carrots Cheez-its	4 Whole Grain Muffin + String Cheese *** Chicken Nuggets Mac N Cheese * Roasted Potatoes Fresh Plum	5 Sausage Breakfast Sandwich *** Pepperoni# or Cheese Pizza* Peas + Carrots Fresh Orange Sunflower Seeds	6 Mini Pancakes + Yogurt *** Teriyaki Chicken Rotini Pasta w/ Beef Side Salad Grapes Corn Star Muffin	7 Egg & Turkey Tac-go *** Chicken Sandwich Fiesta Nada* Lettuce Pickle Cup Sliced Peaches Pretzels
10 F B	11 A R	12 L E	13 L A	14  K
17 Whole Wheat Bagel + Peanut Butter Tub *** Bean+Cheese Chalupa Pizza Hot Pocket* Banana Baby Carrots	18 French Toast Sticks + Turkey Sausage *** Turkey Taco Nada Beef Chili Mac Gala Apple Fresh Pear Goldfish Grahams	19 Colby Cheese Omelet *** Cheese* or Pepperoni Pizza# Chickpea Salad Applesauce Sunflower Seeds	20 Homemade GRANOLA + Yogurt *** Spaghetti w/ Beef Green Chili Burrito Side Salad Diced Peaches Corn Star Muffin	21 Turkey Sausage Frittata *** Cheeseburger Orange Chicken Lettuce Pickle Cup Celery Sticks w/ PB Fortune Cookie

24 Whole Grain Muffin + String Cheese *** Taco Twins PB & Jelly* Fresh Orange Cucumber Coins	25 Sunrise Stick *** Chicken Nuggets Bean+Cheese Burrito* Potato Wedges Green Beans Cracker	26 Whole Grain Concha *** Pepperoni# or Cheese Pizza* Roasted Broccoli Fruit Cocktail Sunflower Seeds	27 Breakfast Burrito *** Teriyaki Beef Dunkers (w/Brown Rice) Grilled Cheese* Side Salad Glazed Carrots	28 English Muffin Treat *** Chicken Sandwich Rotini Pasta w/ Beef Lettuce Pickle Cup Applesauce Corn Star Muffin
31 Ultimate Breakfast Round *** Baja Fish Sticks* Beef Taco Stick Fresh Pear Peas + Carrots				

PRICES:

	Breakfast	Lunch
Full Price	$2.00	$3.25
Reduced	$0.30	$0.40
Adult	$2.75	$3.75

ALSO OFFERING DAILY:

Breakfast:

Breakfast Bar or Cereal

Appendix B: Parental Consent

Dear Parents,
On Tuesday, November 8th, a basic nutrition survey will be conducted through the counseling department at SMS during PE. This survey is simply to gain insight on eating habits, basic knowledge of nutrition, and student opinions regarding the food offered in the cafeteria. Your child's name and information will be in no way attached to the survey. If you have any objection in your child participating in the survey, please indicate below and return this sheet with your child prior to the survey.
Thank you,

Emily Abrahams
CSUMB Counseling Department Intern

I object to having my child participate in the survey. _____
Signature:_____ Date:_____

Estimados padres de familia, El martes, 8 de noviembre, una encuesta sobre nutrición básica se llevará a cabo a través del departamento de orientación durante educación física. Esta encuesta es simplemente para obtener conocimientos sobre los hábitos alimenticios, conocimientos básicos de nutrición y la opinión de los estudiantes con respecto a la comida que se ofrece en la cafetería. El nombre de su hijo y la información no será de ninguna manera objetada en la encuesta. Si usted tiene algún problema en que su hijo participe en la encuesta, sírvase indicar a continuación y devuelva esta hoja con su hijo antes de la encuesta. Gracias, Emily Abrahams Interno de CSUMB del departamento de Consejería Yo objeto a que mi hijo/a que participe en la encuesta.

_____
Firma:_____ Fecha :_____

Appendix C: Nutrition Survey

Nutrition Survey

Circle the answer that is true for you.

How many times a day do you eat fresh fruit? (Not canned, cooked, or processed)
Never……Sometimes……Once a day……Twice a day……More than twice a day

How many times a day do you eat canned or preserved fruit? (Such as a fruit cup)
Never……Sometimes……Once a day……Twice a day……More than twice a day

How many times a day do you eat fresh (not canned, cooked or fried) vegetables? (Ex: salad, carrot sticks, etc.)
Never……Sometimes……Once a day……Twice a day……More than twice a day

How many times a day do you eat cooked (boiled, steamed, or grilled-NOT fried) vegetables?
Never……Sometimes……Once a day……Twice a day……More than twice a day

How many times a day do you eat canned or frozen vegetables?
Never……Sometimes……Once a day……Twice a day……More than twice a day

How many times a week do you eat lean meat? (Ex: grilled, baked or broiled chicken, beef, or pork)
Never……Sometimes……Once a day……Twice a day……More than twice a day

How many times a week do you eat seafood? (Not including fried)
Never……Sometimes……Once a day……Twice a day……More than twice a day

How many times a week do you eat meats such as sausage, hotdogs, bologna, fish sticks, chicken nuggets, bacon, fried chicken, etc.
Never……Sometimes……Once a day……Twice a day……More than twice a day

How many times a week do you eat meat alternatives? (such as tofu)
Never……Sometimes……Once a day……Twice a day……More than twice a day

How many times a week do you eat beans? (such as pinto beans, black beans, lentils, split peas, etc.)
Never……Sometimes……Once a day……Twice a day……More than twice a day

How many times a day do you eat whole-wheat products? ("Brown" or "darker" wheat products such as whole wheat bread, whole wheat tortillas, and whole wheat pasta)
Never……Sometimes……Once a day……Twice a day……More than twice a day

How many times a day do you eat white-bread products (white buns, white sliced bread, flour tortillas, regular pasta etc.)?
Never……Sometimes……Once a day……Twice a day……More than twice a day

How many times a week do you eat snack foods such as regular chips, pork rinds, cheetos, etc.?
Never……Sometimes……Once a day……Twice a day……More than twice a day

How many times a week do you eat foods such as donuts, cinnamon rolls, packaged snack products (Ho-hos, Twinkies) etc.?
Never……Sometimes……Once a day……Twice a day……More than twice a day

How many times a week do you eat candy?
Never……Sometimes……Once a day……Twice a day……More than twice a day

How many times a week do you drink soda, soft drinks, or sugar flavored juices?
Never……Sometimes……Once a day……Twice a day……More than twice a day

How many times a week do you eat fried food? (French fries, onions rings, tater-tots, etc.)
Never……Sometimes……Once a day……Twice a day……More than twice a day

How often do you use spreads such as mayonnaise, ranch, and butter?
Never……Sometimes……Once a day……Twice a day……More than twice a day

How often do you eat pizza?
Never……Sometimes……Once a day……Twice a day……More than twice a day

How often do you eat fast food? (McDonalds, Burger King, Jack in the Box, Taco Bell, etc.)
Never……Sometimes……Once a day……Twice a day……More than twice a day

How many times a week do you eat dessert? (such as ice cream, cake, cookies, etc.)
Never……Sometimes……Once a day……Twice a day……More than twice a day

How often do you eat the food offered in the cafeteria?
Never……Sometimes……Once a day……Twice a day……More than twice a day

How often do you eat breakfast?
Never……Sometimes……Once a day……Twice a day……More than twice a day

What kind of milk do you usually drink?
A. Whole Milk B. Chocolate Milk C. Reduced-fat/fat-free Milk
D. Dairy Alternative (soy, rice milk, etc.) E. None of the above

Which is an example of a healthy snack?
A. Flaming hot cheetos B. Slim Jim C. Pretzles D. Cheez-its

What is the healthiest choice?
A. Chips & Salsa B. Crackers & spinach dip C. Carrots & Ranch D. Celery & low fat dip

Which would you choose?
A. Fruit roll-up B. Apple slices C. Gummy-fruit snacks D. Jell-O

What is an example of whole-grains?
A. Sliced white bread B. Hot-dog bun C. Brown rice D. White rice

What is considered fresh produce?
A. Frozen vegetables B. Tomato Sauce C. Veggie chips D. Salad

What is an example of a healthy meal?
A. Mac and cheese B. Sandwich on whole-wheat bread C. Pizza
D. Burger and French fries

What's the best choice for a drink?
A. Fruit juice B. Water C. Gatorade D. Energy drink

Do you know how to read the labels on food? *Yes* *Sort of* *No*

How many servings of fruit do you think you should have a day?
_____
How many servings of vegetables do you think you should have a day?
_____
Do you like the food offered in the cafeteria? Yes No
Why or Why Not? _____
_____
What suggestions do you have to improve the food offered in the cafeteria?
_____
_____
_____
_____

Appendix D: Nutrition & Academic Analysis Results

Figure 5

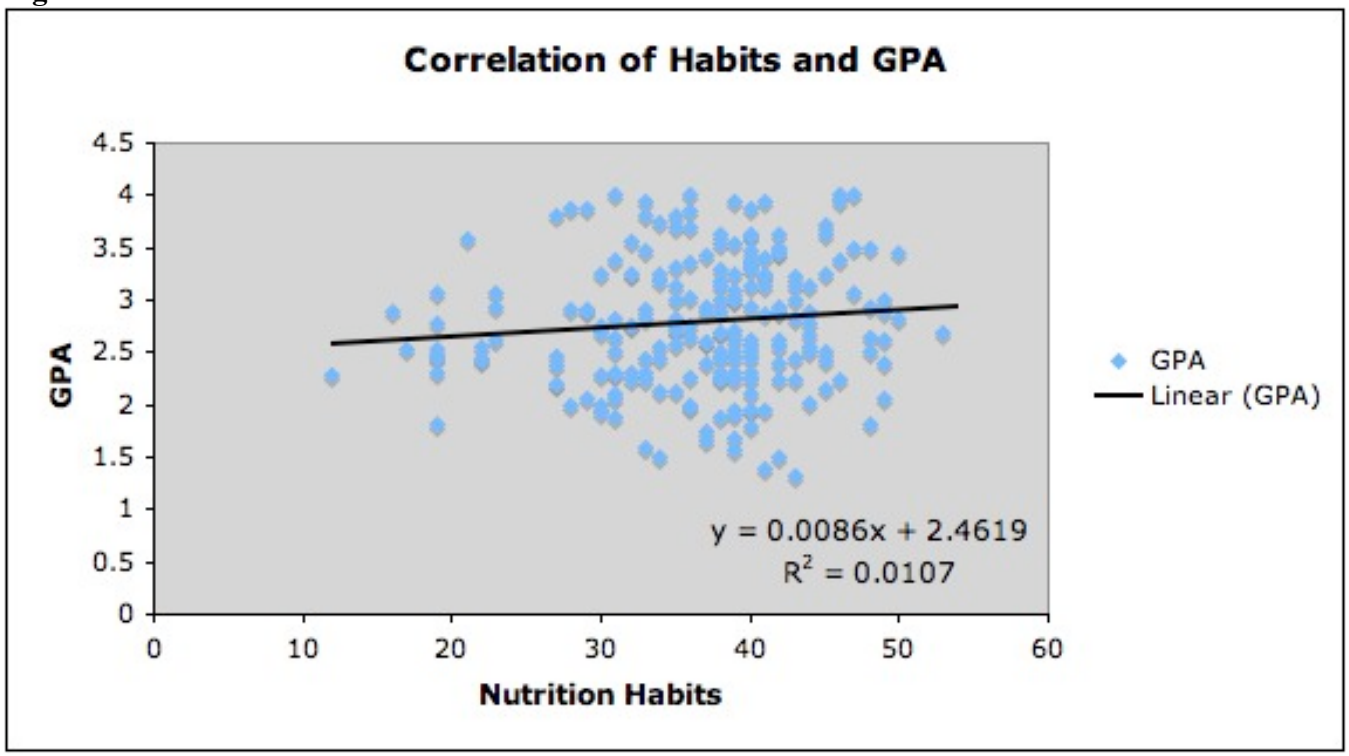


Figure 6

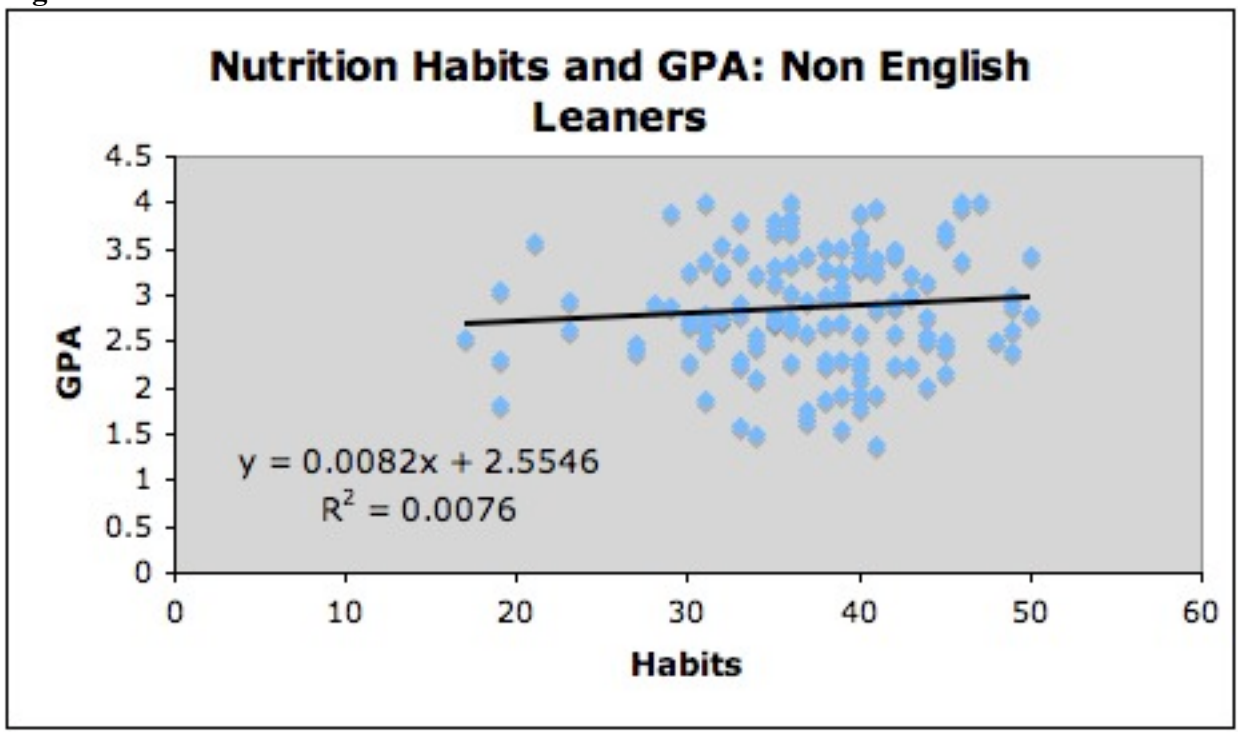


Figure 7

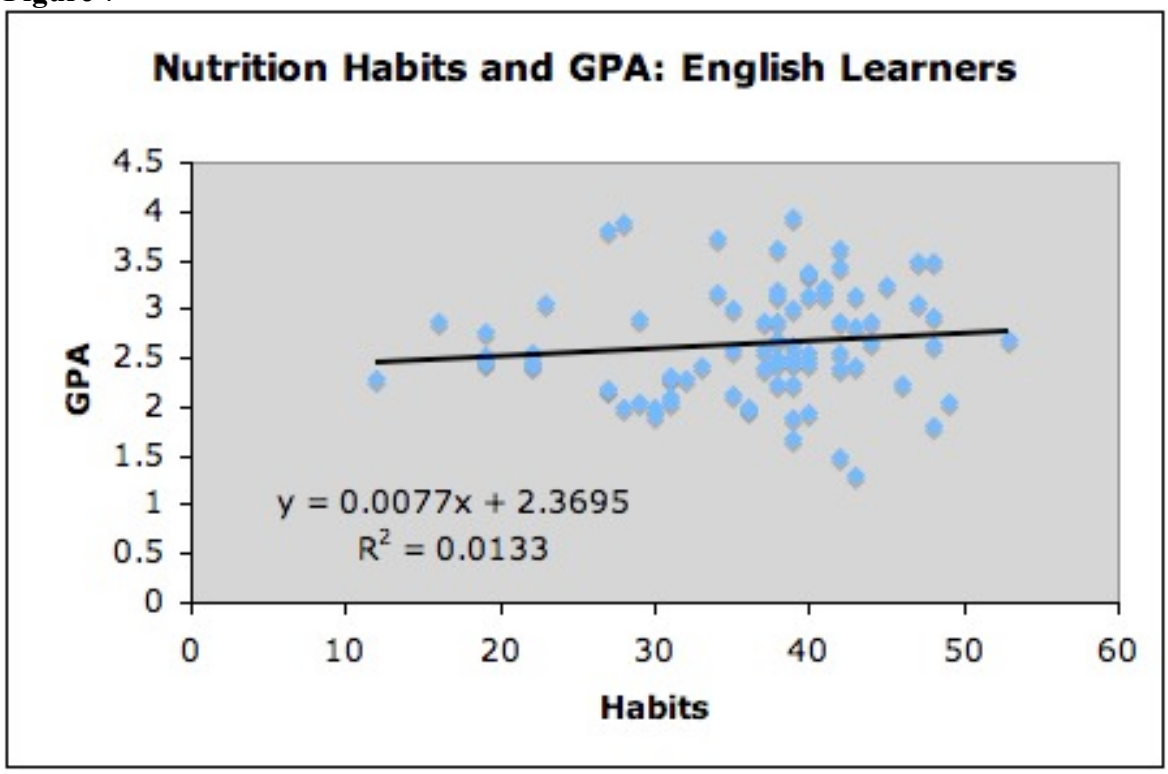


Figure 8

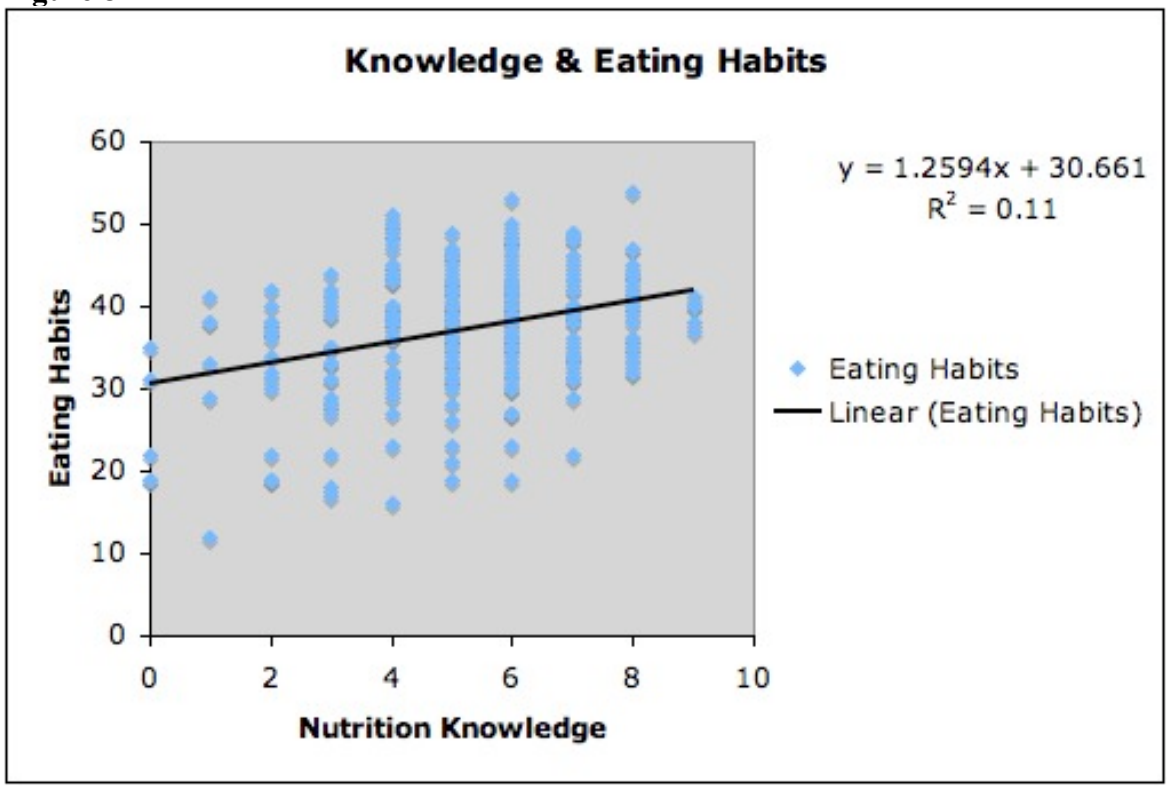
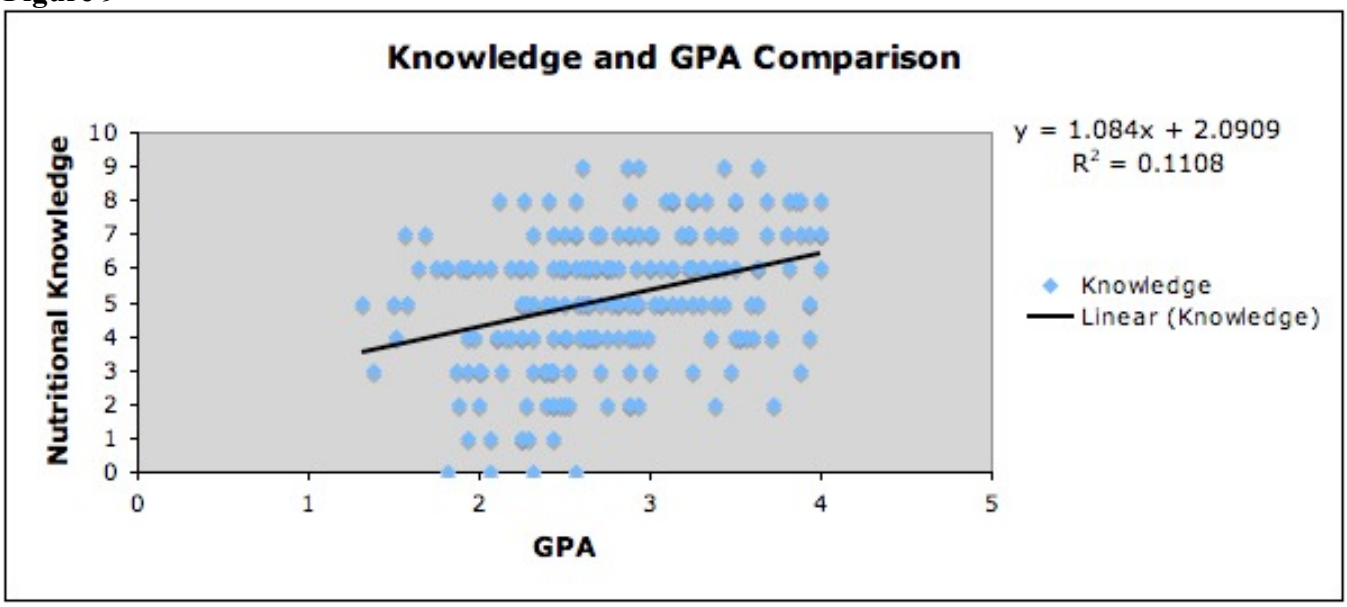


Figure 9


Knowledge and GPA Comparison
Nutritional Knowledge
GPA
y = 1.084x + 2.0909
R² = 0.1108
Knowledge
Linear (Knowledge)
0
1
2
3
4
5
6
7
8
9
10

Appendix E: Harvest of the Month Surveys

Harvest of the Month Student Evaluation (Page 1 of 4)

Confidentiality information to be explained to students

We would like for you to complete this survey. You may skip questions you do not want to answer but we hope that you will answer all of them. Any information about who you are will be kept secret. We will not share you name or identification number. They will only be used for reports.

Funded by the U.S. Department of Agriculture Food Stamp Program, an equal opportunity Provider and employer, through the California Nutrition Network for Healthy, Active Families.

Student identification number _____

We want you to tell us what you know about healthful eating. Please bubble your answer
1. Eating fruits and vegetables can help decrease your chances of getting heart disease or cancer. O True O False O Don't know
2. Fruits and vegetables that are high in Vitamin A are _____ in color. O Red and white O Blue and light brown O Yellow-orange and dark green O Brown and purple O I don't know
3. Almost all fruits and vegetables contain a lot of vitamins and _____. O Protein O Fiber O Cholesterol O Fat O Don't know
4. Which of the following fruits and vegetables are grown in California: O Spinach O Apples O Pears O All of the above
5. Fruits and vegetables, like apples and pears, are best when eaten with the peel because that is where most of the fiber and antioxidants are. O True O False O Don't know

Harvest of the Month Student Evaluation

6. **How much do you like these fruits and vegetables?** Please bubble your answer.

	I do not like this ☹	I like this a little 😐	I like this a lot ☺	I don't know what this is ?
Acorn Squash	O	O	O	O
Asparagus	O	O	O	O
Avocados	O	O	O	O
Beets	O	O	O	O
Broccoli	O	O	O	O
Cabbage	O	O	O	O
Carrots	O	O	O	O
Cherries	O	O	O	O
Cooked Greens	O	O	O	O
Corn	O	O	O	O
Dried Plum	O	O	O	O
Grapefruit	O	O	O	O
Green Beans	O	O	O	O
Mandarins (Tangerines)	O	O	O	O
Melons	O	O	O	O
Mushrooms	O	O	O	O
Nectarines	O	O	O	O
Onions	O	O	O	O
Peas	O	O	O	O
Peppers	O	O	O	O
Persimmons	O	O	O	O
Plums	O	O	O	O
Potatoes	O	O	O	O
Pumpkins	O	O	O	O
Radishes	O	O	O	O
Salad Greens	O	O	O	O
Spinach	O	O	O	O
Sweet Potatoes	O	O	O	O
Tomatoes	O	O	O	O
Zucchini	O	O	O	O

Harvest of the Month Student Evaluation (Page 3 of 4)

	Please bubble your answer.				
7. For breakfast, I think I can...	I disagree very much	I disagree a little	I am not sure	I agree a little	I agree very much
A. drink a glass of my favorite juice	O	O	O	O	O
B. add fruit to my cereal	O	O	O	O	O
8. For lunch at school, I think I can...	I disagree very much	I disagree a little	I am not sure	I agree a little	I agree very much
A. eat a vegetable that's served	O	O	O	O	O
B. eat a fruit that's served	O	O	O	O	O
9. For lunch at home I think I can...	I disagree very much	I disagree a little	I am not sure	I agree a little	I agree very much
A. eat carrot or celery sticks instead of chips	O	O	O	O	O
B. eat my favorite fruit instead of my usual dessert	O	O	O	O	O
10. For a snack I think I can choose...	I disagree very much	I disagree a little	I am not sure	I agree a little	I agree very much
A. my favorite fruit instead of my favorite cookie	O	O	O	O	O
B. my favorite fruits instead of my favorite candy bar	O	O	O	O	O
C. my favorite raw vegetable instead of my favorite cookie	O	O	O	O	O
D. my favorite raw vegetable instead of my favorite candy bar	O	O	O	O	O
E. my favorite raw vegetable instead of chips	O	O	O	O	O
11. For dinner I think I can...	I disagree very much	I disagree a little	I am not sure	I agree a little	I agree very much
A. eat a serving of vegetables	O	O	O	O	O
B. eat my favorite fruit instead of my usual dessert	O	O	O	O	O

Harvest of the Month Student Evaluation (Page 4 of 4)

11. For dinner I think I can...	I disagree very much	I disagree a little	I am not sure	I agree a little	I agree very much
A. eat a serving of vegetables	O	O	O	O	O
B. eat my favorite fruit instead of my usual dessert	O	O	O	O	O

During the past 24 hours (yesterday), how many times did you... (please circle the number of times)						
12. Drink 100% fruit juices, such as orange, apple or grape?	0	1	2	3	4	5 or more
13. Eat fruit? (Do not count fruit juice.)	0	1	2	3	4	5 or more
14. Eat vegetables? (Include salads and non-fried potatoes.)	0	1	2	3	4	5 or more

15. How old are you? _____ Years

16. Are you
- O Boy
- O Girl

17. How do you describe yourself? (You may fill-out more than one)
- O Latino, Hispanic
- O Black, African American
- O White
- O American Indian, Alaskan Native
- O Asian, Pacific Islander
- O Other

Adapted from "Harvest of the Month Survey," available at http://www.cdph.ca.gov/programs/CPNS/Documents/Network-Compendium.pdf

Cullen K, Baranowski T, et al. Availability, accessibility, and preferences for fruit, 100% fruit juice, and vegetables influence children's dietary behavior. Health Educ Behav 2003; 30(5): 615-26.

Baranowski T, Davis M, Resnicow K, Baranowski J, Doyle C, Smith M, Lin L, Wang DT. Gimme 5 fruit and vegetables for fun and health: Outcome Evaluation. Health Education & Behavior 2000; 27(1):96-111.

Appendix F: Harvest of the Month Results

Figure 10:

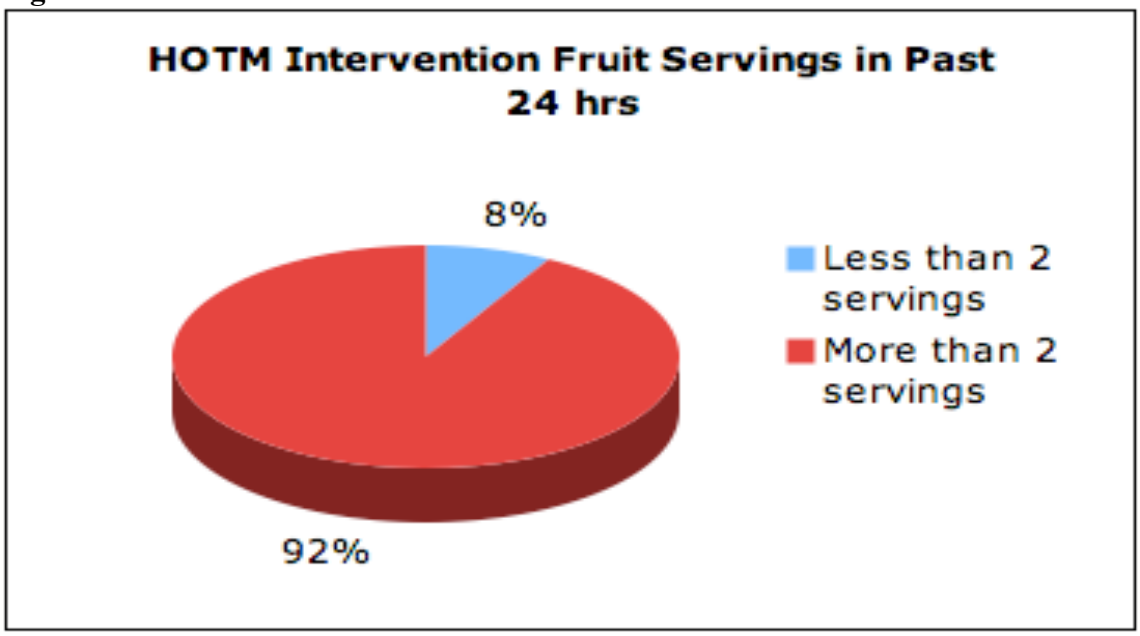


Figure 11:

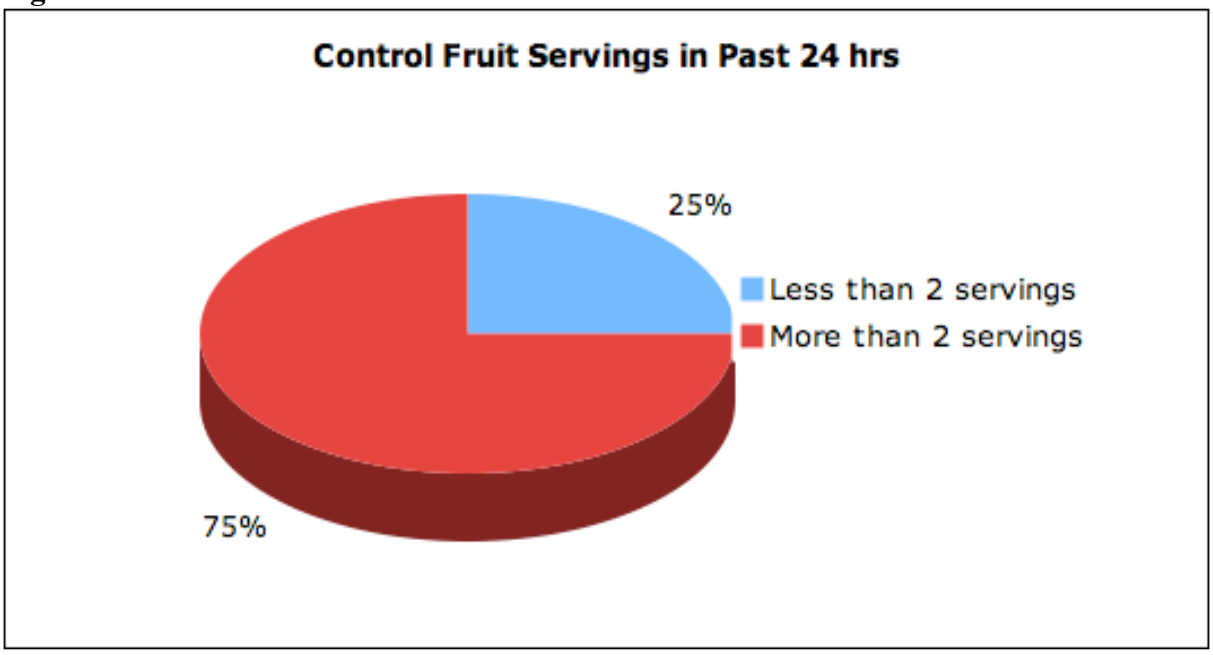


Figure 12:

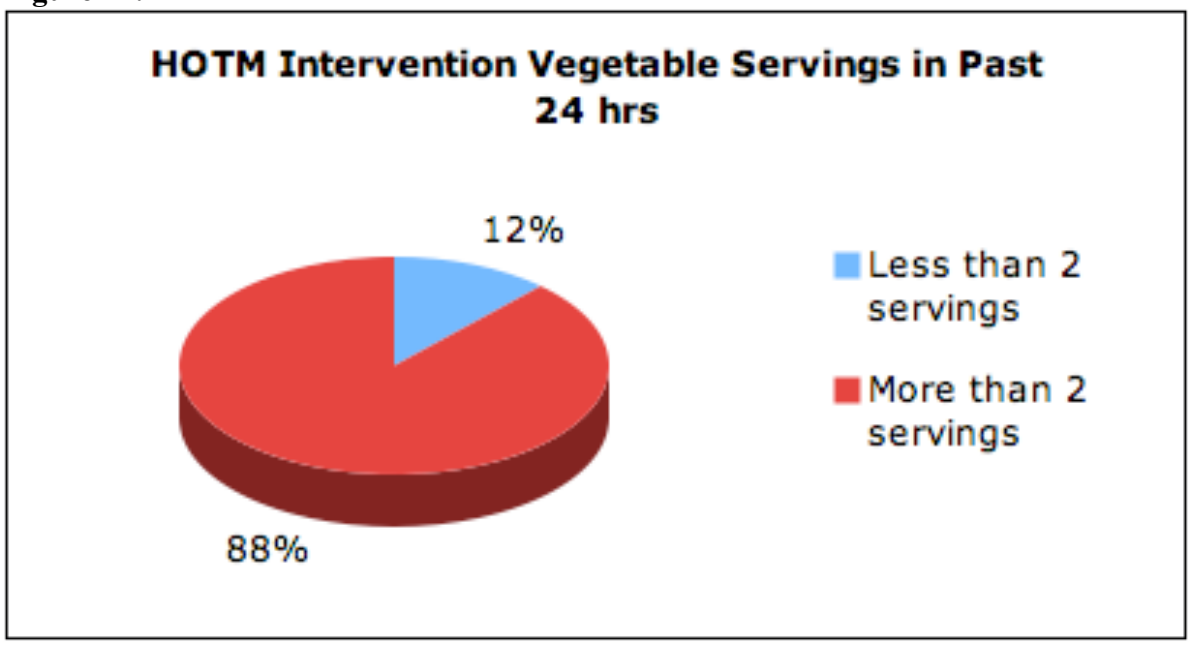
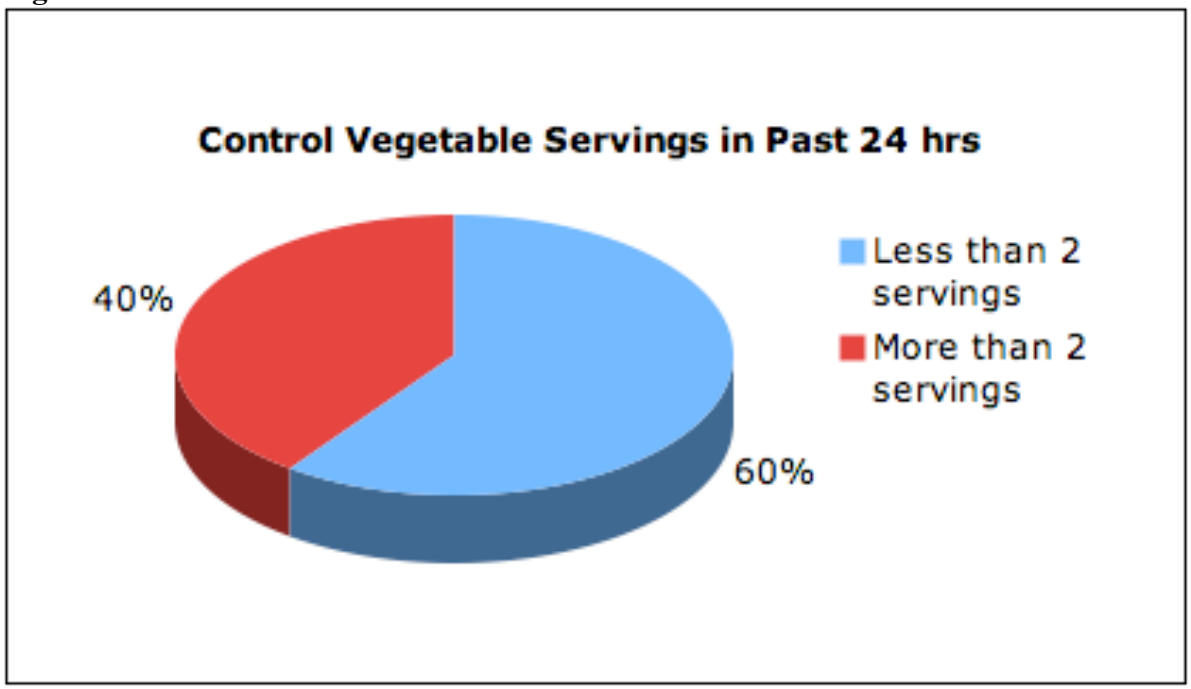


Figure 13:



Appendix G: Funding Options

Detailed Fundraising Opportunities

Use this resource to contact different organizations that may be able to help you find funds to pay for Harvest of the Month Tasting Kits in the 2012-2012 School year!

Contact your local farm bureau to see if they would like to sponsor your school: San Benito County Farm Bureau, (831) 637-7643, sbcfb@garlic.com San Mateo County Farm Bureau: (650) 726-4495, smcfbhmb@aol.com Monterey County Farm Bureau: (831) 751-3100, administration@montereycfb.com Santa Cruz County Farm Bureau (831) 724-1356, sccfb@sbcglobal.net Santa Clara County Farm Bureau: (408) 776-1684, sccfb@sccfarmbureau.org

Health Service Departments:

San Mateo County:

Get Healthy San Mateo County (GHSMC) Task Force

http://www.gethealthysmc.org/103-Healthy-Fundraising-for-Your-SchoolSports-Club.aspx

This website webpage lists healthy fundraising ideas

http://www.gethealthysmc.org/28-Funding.aspx

Lists current grants that are available to the community (great resource)

School Boards: Santa Cruz County School Board: sczcsba@gmail.com Santa Clara County School Board: (408) 453-6515, savgmom@gmail.com

Rotary Clubs

Contact your local rotary club to see if they are willing to give your school a scholarship.

Grants:

1. Donors Choose

http://www.donorschoose.org/

Applications ongoing

Allows public school teachers to post requests that will directly benefit students. The process and rules are pretty straightforward. Teachers complete a one page application on line. Be sure your proposal does not foster discrimination or proselytize a religious or political viewpoint. Concerned individuals, Donors Choose calls them Citizen Philanthropists, select projects to fund.

2. National Education Association Foundation

http://www.neafoundation.org/pages/educators/grant-programs/grant-application/student-achievement-grants/

Application deadlines are: February 1, June 1, and October 15 The NEA Foundation provides grants to improve the academic achievement of students in U. S. public schools and public higher education institutions in any subject area(s). The proposed work should engage students in critical thinking and problem solving that deepen their knowledge of standards-based subject matter. The work should also improve students' habits of inquiry, self-directed learning, and critical reflection. Grant funds may be used for resource materials, supplies, equipment, transportation, software, or scholars-in-residence. Although some funds may be used to support the professional development necessary to implement the project, the majority of grant funds must be spent on materials or educational experiences for students. The grant amount is $5,000.

3. **Lowe's Charitable & Educational Foundation** http://www.cybergrants.com/lowes/start_app.html *Applications ongoing*